Remarks

Claims 30 and 40-45 are now pending in this application.

In the Office Action dated April 19, 2007 the Examiner rejected claims 30 and 40-45 under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. Claims 30 and 41-45 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Reny, WO89/09806. Claim 40 stands rejected under 35 U.S.C. § 103(a) as being obvious in view of Reny, WO89/09806. Claims 30 and 40-45 stand rejected under 35 U.S.C. § 103(a) as being obvious in view of in view of Meyer et al., Patent No. 5,118,434, or in view of Maes et al., U.S. Patent No. 5,366,651. Claims 30 and 40-45 also stand rejected under 35 U.S.C. § 103(a) as being obvious in view of Wood, U.S. Patent No. 4,455,248. Claims 30 and 40-45 were also provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-9, 11 and 12 of copending Application No. 10/264,041; claims 27-50 of Application No. 09/910,497; and claims 22-29 of Application No. 10/935,897. Applicants respectfully request reconsideration in view of the amendments to the claims and the remarks set forth below.

Claim 30 has been amended to clarify that the method of the present invention results in a heat transfer fluid that is less toxic than 10,000 mg/kg on the basis of an acute LD_{50} oral toxicity in rats. This amendment is supported in the specification, as the examiner noted in the Office Action at page 3 that the specification supports this oral toxicity level.

Claim 30 as amended recites a method for reducing the oral toxicity of an ethylene glycol based, non-aqueous heat transfer fluid. The method comprises mixing a non-aqueous, ethylene glycol based heat transfer fluid with propylene glycol to achieve a propylene glycol concentration of between about 5 percent by weight and 30 percent by weight of the total weight

of the ethylene glycol and propylene glycol in the resulting non-aqueous heat transfer fluid. Claim 30 as amended recites that the non-aqueous heat transfer fluid resulting from combining the ethylene glycol based fluid with propylene glycol in the recited proportions is less toxic than 10,000 mg/kg on an acute LD_{50} oral toxicity basis in rats. Claim 30 further recites that the resulting non-aqueous fluid contains at least one corrosion inhibiting additive that is soluble in both ethylene glycol and propylene glycol, and that the resulting heat transfer fluid contains no additive that requires water to dissolve the additive or to enable the additive to function.

Claims 40-45 all depend from claim 30 and recite further embodiments of the invention.

Rejection of Claims 30 and 40-45 Under 35 U.S.C. § 112

Claims 30 and 40-45 stand rejected under 35 U.S.C. § 112 first paragraph on the grounds that the specification does not provide any basis for an LD_{50} "greater than 10,000 mg/kg" because the term has no upper limit. Applicant has amended the claim to recite that the resulting heat transfer fluid is less toxic than 10,000 mg/kg on an acute LD_{50} oral toxicity in rats. As noted by the Examiner at page 3 of the Office Action, there is support for this toxicity limitation in the specification. Accordingly, claim 30 as currently presented is fully supported in the specification, and the rejection under 35 U.S.C. § 112 should be withdrawn.

The Rejections Under 35 U.S.C. §§ 102(b) and 103(a)

In the Office Action dated April 19, 2007, the Examiner has essentially reiterated the rejections previously made under 35 U.S.C. §§ 102(b) and 103(a). For the reasons stated in Applicants Response to Office Action filed on January 23, 2007, which is incorporated herein by reference, the amended claims are patentable over all of the cited references under 35 U.S.C. §§ 102(b) and 103(a). Claims 30 and 40-45 as amended are also patentable over the cited references for the additional reasons set forth below.

In order for a prior art reference to anticipate or render a claimed invention obvious, the prior art reference must enable one skilled in the art to practice the claimed invention without undue experimentation. "The disclosure in an assertedly anticipating reference must be adequate to enable possession of the desired subject matter." Elan Pharmaceuticals, Inc. v. Mayo Foundation for Medical Education and Research, 346 F.3d 1051, 1055 (Fed. Cir. 2003). Enablement requires that the reference allow one skilled in the art to carry out a claimed method without undue experimentation. Id. at 1054. "To render a later invention unpatentable for obviousness, the prior art must enable a person of ordinary skill in the field *to make and use the later invention.*" In re Kumar, 418 F.3d 1361, 1369 (Fed. Cir. 2005). See also Beckman Instruments, Inc. v. LKB Produkter AB, 892 F.2d 1547, 1551 (Fed. Cir. 1989)("In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method."). In this case, there is nothing in the cited references which would allow one skilled in the art to practice the claimed methods. None of the references even recognize the problem of oral toxicity of ethylene based heat transfer fluids, much less describe a solution to that problem. Moreover, none of the references describe any specific compositions within the claimed range, and none of the references teach or suggest how to reduce the toxicity of an ethylene glycol based heat transfer fluid in the manner claimed.

Claims 30 and 41-45 stand rejected under 35 U.S.C. § 102(b) as anticipated by Reny, WO89/09806, and claim 40 stands rejected under 35 U.S.C. § 103(a) as obvious in view of Reny. In addition to the reasons set forth in detail in applicant's response filed on January 23, 2007, these rejections should be withdrawn because Reny does not enable one skilled in the art to practice the methods of claims 30 and 40-45 as amended. First of all, Reny does not describe any specific embodiment that contains no water. Indeed, all of the embodiments described by Reny containing ethylene glycol and propylene glycol contain added water. Accordingly, Reny

does not enable one skilled in the art to practice the claimed methods for preparing a non-aqueous, ethylene glycol based heat transfer fluid having reduced oral toxicity.

As set forth in detail in applicant's prior response, although Reny makes the broad statement that the fluids he describes may contain little or no water, all of the examples and fluids actually described by Reny contain added phosphoric acid, which requires the addition of water. While Reny implies that there may be alkylene glycols or mixtures of alkylene glycols for which buffering would not be necessary, Reny does not specify any glycols or mixtures that do not require pH adjustment. Most importantly, Reny, by his examples in the specification, teaches that for propylene glycol and for mixtures containing propylene glycol and ethylene glycol, the addition of phosphoric acid is necessary for pH control. Reny, pages 7-9. Accordingly, Reny does not enable one skilled in the to practice the claimed methods utilizing ethylene glycol and propylene glycol because Reny teaches the addition of phosphoric acid with the necessary water to dissolve the phosphoric acid and allow it to function.[1]

In addition to Reny's teachings regarding the use of phosphoric acid in fluids comprising ethylene glycol and propylene glycol, Reny does not teach or suggest the combination of ethylene glycol and propylene glycol in the proportions recited in claims 30 and 40-45 as amended for any purpose, much less to reduce the oral toxicity of the resulting fluid. Reny does not even mention oral toxicity, much less teach or suggest a solution to that problem. Reny's general statement that mixtures of alkylene glycols may be used is insufficient to enable one skilled in the art to practice the claimed methods of producing a non-aqueous, ethylene glycol based heat transfer fluid having reduced toxicity by adding propylene glycol in the amounts recited in the claims. There are literally an infinite number of combinations of alkylene glycols

[1] The only composition described in Reny containing no added water is a control sample having only ethylene glycol and propylene glycol without corrosion inhibitors. Reny teaches that this composition is not acceptable for use due to the very high corrosion rates reported with the fluid.

encompassed by Reny, but Reny does not recite any that result in unexpectedly reduced oral toxicity as recited in the claims as ameded. One skilled in the art could not perform the methods of claims 30 and 40-45 based upon Reny without experimentation of the type performed by the inventors and reported in the specification. Accordingly, Reny does not enable one skilled in the art to practice the invention of claims 30 and 40-45.

Claims 30 and 40-45 stand rejected under 35 U.S.C. § 103(a) in view of Meyer, U.S. Patent No. 5,118,434 Maes, U.S. Patent No. 5,366,651 or Wood, U.S. Patent No. 4,455,248. These references, and several reasons why they do not render the claimed methods obvious, have been discussed in detail by applicants in the January 23, 2007 Response to Office Action. In addition to those reasons previously set forth by applicant, each of these references is insufficient to render the claimed methods obvious because these references, like Reny, do not enable one skilled in the art to practice the claimed methods.

As pointed out previously by the applicant, the examiner's statements that Meyer, Maes and Wood "suggest reducing the oral toxicity of nonaqueous fluids containing ethylene glycol by mixing with ethylene glycol in the specific proportions recited by the instant claims" is incorrect. None of Meyer, Maes or Wood recognize or discuss the problem of reducing the oral toxicity of ethylene glycol based fluids, much less describe, teach or suggest a method to reduce the toxicity of a non-aqueous ethylene glycol based fluid as recited in claims 30 and 40-45 as amended. Moreover, none of Meyer, Maes or Wood describe, teach or suggest combining non-aqueous ethylene glycol based heat transfer fluids with propylene glycol in any specific proportions, much less the specific proportions recited in claims 30 and 40-45 as amended, which results in an ethylene glycol based non-aqueous heat transfer fluid having an unexpectedly large decrease in oral toxicity. At most, Meyer, Maes and Wood describe broad generic formulations that may, in some instances which are not specifically taught or described in any of these references,

encompass some of the fluids produced by the claimed methods. This is insufficient to support the rejection of the claims based upon either Meyer, Maes or Wood. See In re Baird, 16 F.3d 380, 382 ("The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious.");In re Jones, 958 F.2d 347 (Fed. Cir. 1992)(reference which described an infinite genus of salts of dicamba did not render obvious a claimed salt that was not specifically described in the reference); MPEP § 2144.08.

In addition, Meyer, Maes and Wood do not provide a description that would allow one skilled in the art to practice the methods of claims 30 and 40-45 without undue experimentation. None of these references describe reducing the oral toxicity of a non-aqueous, ethylene glycol based heat transfer fluid, and none of these references describe any ethylene glycol based fluid, whether used for heat transfer or otherwise, having ethylene glycol and propylene glycol in the ranges recited in claims 30 and 40-45 as amended. One skilled in the art reading Meyer, Maes or Wood could not arrive at the method for reducing the oral toxicity of an ethylene glycol based heat transfer fluid recited in claims 30 and 40-45 without performing the experiments described in the specification. Accordingly, Meyer, Maes and Wood do not enable one skilled in the art to practice the claimed methods, and claims 30 and 40-45 are patentable over these references under 35 U.S.C. § 103(a) for this additional reason.

The Double Patenting Rejection

The Examiner has issued a provisional double patenting rejection citing four copending patent applications. Pursuant to MPEP § 804, if this is the sole remaining rejection prior to issuance of any of the copending applications as patents, this rejection should be withdrawn in this case. While Applicants do not admit that the claims of the present invention are obvious in view of any one of those copending applications, in the event that one or more of the copending

applications issues as a patent prior to this application, Applicants will file a terminal disclaimer to obviate the double patenting rejection.

In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes after considering these remarks, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

Because the reasons above are sufficient to traverse the rejection, Applicants have not explored, nor do they now present, other possible reasons for traversing such rejections. Nonetheless, Applicants expressly reserve the right to do so, if appropriate, in response to any future Office Action.

A Request for Continued Examination and the associated fee have been filed herewith. No additional fee is believed to be required. If any fee is required, or if necessary to cover any deficiency in fees previously paid, authorization is hereby given to charge our Deposit Account No. 50-3569.

Respectfully submitted,

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